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RECORD OF GEOGRAPHICAL PROGRESS.

NORTH AMERICA.

GOLD IN THE YUKON REGION OF ALASKA.—A Geological Survey party, in charge of Mr. J. E. Spurr, made a reconnoissance of the gold resources of the Upper Yukon in Alaska, last summer, crossing the Chilkoot Pass about June 15 to the upper part of the river and travelling down stream to Forty Mile Creek, Birch Creek and other gold-bearing localities which were carefully explored. The expedition was able to determine the place of the gold-bearing rocks from which is derived the gold found in the river gravels. These rocks form a broad belt running northwest into Alaska from British territory. Schists and gneisses, with intrusive rocks, constitute their lower portions, upon which altered sedimentary rocks rest. Carboniferous and younger rocks overlie them on both sides of the belt, proving that the gold-bearing rocks are older than the carboniferous. The gold in this belt occurs partly in quartz veins and partly in deposits formed along shear-zones. Mr. Spurr described the results of this expedition before the Geological Society in Washington on Nov. 11.

KAFIR INSTEAD OF INDIAN CORN.—The settlers in western Kansas, northern Texas, and the Indian Territory found by bitter experience that they could not depend upon raising crops of Indian corn to fatten their stock owing to the semi-arid conditions. A great many farmers in Kansas abandoned their farms on this account. A substitute for Indian corn, that will thrive under the climatic conditions, has been found and bids fair to have an important influence upon the development of that vast region. Kafir corn, which is largely raised in some parts of Africa, yields well in our semi-arid belt where it has now become a staple crop. It nearly or quite equals Indian corn as food for stock, and, though there is little demand for it in the markets, it commands as good a price as Indian corn when converted into pork, beef or draught animals. This is a striking instance of the adaptation of products to environment. Experimentation that has resulted so successfully as in this case shows the usefulness of the new division of our Department of Agriculture, the Division of Biological Survey which, under the direction of Dr. C. Hart Merriam, is now studying the geographical

distribution of plants and animals, and their adaptation to the various sections of our territory. A natural outcome of this work will be the introduction of new species of economic plants from abroad in parts of the United States where the climate and soil are particularly adapted for them.

TRADE OF THE UPPER YUKON.—Mr. Alexander Begg, describing the Yukon country (*Scot. Geog. Mag.*, Nov., 1896), many of his facts being derived from Mr. Albert McKay, of the Canadian Land Survey, says the towns in the upper Yukon region, Forty Mile City, Fort Cudahy and Circle City, are mining and trading camps. The North American Trading and Transportation Company, established in 1892, does a very large business and has a large establishment at Cudahy, which is three-fourths of a mile across the creek from Forty Mile City. The company's steamer plies on the river. The Alaska Commercial Company has an extensive establishment at Forty Mile City and two steamers on the Yukon, and each company is building another steamer for next year's trade. They do a very large business with the miners, and are unable as yet to supply the demand. The Alaska Commercial Company does the larger part of the business. It sold out all its supplies before winter fairly began in 1895, and had to buy \$30,000 worth of merchandise from the other company. The two companies sold last year about \$680,000 worth of goods to miners and others in the district from Forty Mile to Circle City. The currency is mostly gold dust taken at \$17 an ounce. Mr. Ogilvie, Chief Dominion Surveyor, asserts that before many years agriculture, to some extent, may be successfully carried on in this region. Another writer says of Forty Mile City: "The price of restaurant board is \$12 a week and whiskey is fifty cents a glass over the bar. The town is an ideal '49 camp; its saloons, gambling houses, concert halls, etc., give it an air of bustling activity, from which, however, the element of lawlessness is almost entirely eliminated. Miners' law prevails, and justice is fairly and impartially administered."

NEW DISTRICTS IN CANADA.—The Statistical Year Book of Canada gives the boundaries of the provisional districts into which the northern part of the Dominion has been divided. (1) The District of *Ungava*, bounded north by Hudson Strait, south by Quebec province, east by the Dependency of Newfoundland on the Labrador coast, and west by Hudson Bay and Ontario, all islands within three miles of the coast included. (2) *Franklin* includes all the

Arctic islands from Baffin Bay, Smith Sound and Robeson Channel on the east to Banks Land and Prince Patrick Land on the west, the south boundary running from Cape Best through Hudson Strait, Fox Channel, the Gulf of Boothia, Franklin, Ross and Simpson Straits, Dease Channel and Dolphin and Union Strait. (3) *Yukon*, bounded west by Alaska, south by British Columbia, and east by a line drawn through the west mouth of the Mackenzie River along the 136th meridian to the range of mountains north of the Pelly River and then along the range to the Liard River on the British Columbian boundary. (4) *Mackenzie*, extending from the Yukon district eastward to the 100th meridian and southward to British Columbia and Athabasca. It is proposed to add to Athabasca the territory north of Saskatchewan as far east as the 100th meridian. The district of *Keewatin*, which has been indicated on the maps for some years, lies between the 100th meridian and the west coast of Hudson Bay, and is now extended to the northern edge of the continent by adding a territory embracing about 470,000 square miles.

Canada has thus divided into five districts all the parts of her possessions not previously defined, and has included in them the Arctic regions of Grinnell Island, discovered and named on Sept. 21, 1850, by the first Grinnell expedition, in honor of Mr. Henry Grinnell, the first president of the American Geographical Society, who equipped and despatched the expedition to aid in the search for Sir John Franklin; also Grinnell Land, named in 1853 by Kane, who explored its coast to Carl Ritter Bay; also Grant Land, its northern extension, named by Dr. Bessels of the Polaris expedition of 1871-73.

TIDES OF THE BAY OF FUNDY.—The rise and fall of the tide in the Bay of Fundy are not found, upon careful examination, to be quite so excessive as we were taught at school to believe, though they are remarkable. Mr. Chalmers reports (Geolog. Surv. of Canada, 1894, Report M), that the bay is 48 miles wide at its mouth, and the bottom, which there is 70 to 110 fathoms deep, rises at an average rate of four feet a mile all the way to the head of the bay. On the coasts, just outside the mouth of the bay, the spring tides vary from 12 to 18 feet. Within the bay the greatest tidal oscillations are at Noel River, where the spring tide rises 53 feet and the neap tide 31 feet.

THE NEW YORK STATE FOREST RESERVATION.—The defeat of the forestry amendment to the Constitution of New York State in

the November election was a cause of gratification to all who are interested in the forest preserve in the Adirondacks. It was proposed by the amendment to permit the lease, exchange or sale of small parts of the reservation, and the amendment seemed designed chiefly for the benefit of those who desire to maintain summer houses among these primeval forests. There are scientific and other reasons why the integrity of the Reservation should be preserved.

SOUTH AMERICA.

EXPEDITION TO THE CHILIAN ANDES.—Mr. E. A. FitzGerald, who recently returned to England from his explorations in the New Zealand Alps, has started, according to *The Geographical Journal*, for the Chilian Andes, his main purpose being to ascend Aconcagua, the highest summit of South America. There are ten persons in the party, including Mr. Vine, geologist, Mr. de Trafford, surveyor, and Mr. Gosse, naturalist. From Buenos Aires the party will go to Mendoza, and will thence make straight for Aconcagua, which will be ascended in a leisurely fashion so as to give ample time for scientific work. The explorer's object is to watch the effect of the various altitudes on the system with a view to still higher climbs among Himalayan peaks. It is to be expected that the party will succeed in settling the question of the origin of the mountain. Such recent writers as Reclus and Sievers leave this question open, though there is little doubt that Aconcagua is of volcanic origin.

ARGENTINE EXPLORATIONS.—Dr. Polakowsky writes in *Petermanns Mitteilungen* (1896, No. 9), that the series of explorations begun in 1894 along the Bolivian frontier under the direction of Dr. F. P. Moreno, director of the Museo de La Plata, and continued during the past year in the districts bordering the southern part of the Andes, has been completed. The various parties travelled over 25,000 miles. The collections fill 400 chests, and 2,000 photographs were taken. The little-known territories of Neuquen, Rio Negro and Chubut have been carefully surveyed. Eight new lakes have been discovered north of Lake Nahuel Huapi and fifteen south of it. The Rio Teteleufu, whose course was not known, has been explored from its source, and much of the way it has a depth of 25 feet. Dr. Moreno is convinced that nothing but a railroad from the east coast to the neighborhood of Lake Nahuel Huapi is needed to assure that fertile and beautiful region an excellent future.

POPULATION OF THE ARGENTINE REPUBLIC.—*Petermanns Mitteilungen* for October contains the results of the second census of the Argentine Republic, made in May, 1895. The results by provinces and territories are as follows:

PROVINCES AND TERRITORIES.	POPU- LATION.	INCREASE PER CENT. PER ANNUM SINCE THE FIRST CEN- SUS (SEPT. 1869).	PROVINCES AND TERRITORIES.	POPU- LATION.	INCREASE PER CENT. PER ANNUM SINCE THE FIRST CEN- SUS (SEPT. 1869).
Buenos Aires :					
Capital.....	663,854	9.9	Prov. Jujuy	49,543	0.9
Province.....	921,225	7.8	Prov. Salta.....	118,138	1.3
Terr. Misiones....	33,005	...	Prov. Tucuman....	215,693	3.8
Prov. Corrientes....	239,570	3.3	Prov. Catamarca...	90,187	0.5
Prov. Entre Ríos....	290,994	4.5	Prov. La Rioja....	69,228	1.6
Terr. Formosa.....	4,829	...	Prov. San Juan....	84,251	1.5
Terr. Chaco.....	10,280	...	Prov. Mendoza....	116,698	3.1
Prov. Santa Fé....	397,285	13.4	Terr. Neuquén.....	14,517	...
Prov. Santiago....	160,445	0.8	Terr. Rio Negro....	9,300	...
Prov. Córdoba....	351,745	2.6	Terr. Chubut	3,748	...
Prov. San Luis....	81,155	2.0	Terr. Santa Cruz...	1,058	...
Terr. Pampa.....	25,765	...	Terr. Tierra del Fuego	477	...

The total population, including estimates of 60,000 unenumerated and 30,000 Indians, is given at 4,043,000. The most rapid increase occurs in the province of Santa Fé, and is due to the large extension of agriculture there, chiefly wheat-raising. Fifteen towns, besides the capital, have a population of over 10,000, viz.: Rosario, 92,442; La Plata, 43,565; Córdoba, 42,783; Tucuman, 34,297; Mendoza, 28,803; Paraná, 23,922; Santa Fé, 23,818; Salta, 16,672; Corrientes, 16,058; Chivilcoy, 14,632; Gualeguaychu, 13,003; Concordia, 12,449; San Nicolás, 12,281; San Juan, 10,410; Barracas al Sur, 10,185.

CHILI'S NEW TREATY WITH BOLIVIA.—Telegraphic information received concerning the new treaty between Chili and Bolivia concluded on May 1, briefly reported that in accordance with the truce of 1884, Bolivia cedes to Chili the whole of the province of Antofagasta. Bolivia appears therefore to be permanently deprived of a seaport.

EUROPE.

EROSION OF ENGLISH COASTS.—A report to the British Association (1895) shows that for 37 years the clay coast of Yorkshire, from Bridlington to Spurn Head, has had an average annual recess-

sion of 5 feet 10 inches. Drifting shingle is caught by the piers at Dover and Folkestone, and thus the cliffs beyond are deprived of their natural protection.

THE NANSEN RESEARCH FUND.—The London *Times* says a fund is raising in Norway to commemorate Nansen's Arctic expedition. It is to be known as "The Fridtjof Nansen Fund" for scientific research, the income to be devoted to the promotion of science in various departments and the publication of the results. The fund will probably be under the care of the Christiania University, the Norwegian Society of Science and the Bergen Museum. Over 300,000 kroner (about \$81,000) have thus far been subscribed. Contributors to the fund may communicate with the Committee, University of Christiania.

THE IRON GATES OF THE DANUBE.—The formal opening of the Danube Ship Canal at the Iron Gates (BULLETIN, 1896, No. 2, p. 162), occurred on Sept. 27 last. Dr. K. Peucker, of Vienna, has written a very clear statement of the nature of this work (*The Geographical Journal*, Dec., 1896), which has opened the upper Danube to vessels of considerable size. The main object was to clear some fifty miles of the rapids and shallows obstructing the river, and particularly to cut a clear channel, 200 feet wide and 10 feet deep, through five dikes crossing the river-bed. These dikes had to be blasted with dynamite. The obstacles at the Irlaz-Tachtalia rocks were circumvented by a canal and dam giving the Danube a new right bank for four miles and narrowing its bed from 6,500 to 1,000 feet. A canal was also cut around the largest rock shoal at the Iron Gate proper. On the Prigrada bank in the river, the workmen found the remains of two very large unfinished dams erected by Trajan to confine the waters of a canal. There remain a few obstacles below the Iron Gates which it is hoped to remove by the end of 1898.

AFRICA.

NATURAL HISTORY EXPEDITION IN SOMALILAND.—Prof. D. G. Elliot, of the Field Columbian Museum of Chicago, and his assistant, Mr. C. E. Akeby, returned to this country in November, after a very successful expedition into Somaliland, whither they went in March last to make a natural history collection for the museum. Fifty-eight cases and barrels of specimens were shipped from Aden to Chicago. The collections were chiefly of the large mammals,

but over 300 specimens of birds, fish, insects and reptiles were also obtained.

AGRICULTURAL EXPERIMENT STATION.—The Germans in East Africa are following approved methods in studying the resources and capabilities of their territory. They have established an agricultural experiment station among the Usambara Mountains, which border the interior plateau and separate it from the coastal plain, the mountains being 75 to 100 miles from the Indian Ocean. This mountain region is comparatively healthful. Here the Germans are testing both native and introduced tropical plants at different altitudes to decide which are best suited for cultivation among these comparatively fertile mountain valleys; and when these points are determined, plants and seeds will be supplied for the plantations already opening there.

THE EAST AFRICA PROTECTORATE.—The London *Gazette*, of Sept. 1, announces that all the territory in East Africa, under the protectorate of Great Britain, except the islands of Zanzibar and Pemba and the Uganda Protectorate, are now included in one administration known as the East Africa Protectorate. This is the vast district extending from the Indian Ocean to the Uganda Protectorate, that has been known for some years as Ibea, and it includes all the islands near the coast between the Jub and the Umbo Rivers. The Uganda Protectorate has been extended so as to include the territory of Unyoro, north of Uganda, and districts west of these two regions, and the Protectorate, therefore, now embraces the country northward to the Victoria Nile and westward to Lakes Albert and Albert Edward, and includes the greater part of the Ruwenzori range and the lower part of the Semliki Valley.

THE FRENCH RAILROAD TO THE NIGER.—The French Government has decided to complete its railroad from the upper Senegal to the Niger. Starting at Kayes, the point on the upper river reached by steamboats from the Atlantic Coast, it was completed as far east as Bafulabe in 1888. The extension to Bammaku on the Upper Niger has now begun, and a bridge has been built over the Bafing near its junction with the Bakhoi. (*Bulletin du Comité de l'Afrique Française*, Nov., 1896.)

ASIA.

DIVERTING THE AMU-DARIA TO THE CASPIAN.—The Russian Government has sent Gen. Glukhowsky to the Amu-daria (Oxus River)

to make further researches as to the possibility of connecting the river with the Caspian by a canal which, if feasible, would add much to the transportation facilities of that region. This renewed exploration was incited by the fact that, some time before the coronation of the Czar, the Amu-daria began again to send a part of its waters into the Uzboi, which is asserted by some writers to be the channel through which the Amu-daria formerly flowed to the Caspian. The reason for the present partial discharge into the Uzboi appears to be the destruction of a dam in the Khanate of Khiva. By means of this dam all the waters had been directed into Lake Aral.

THE UPPER YANGTSE RIVER.—The *Comptes Rendus* of the Paris Geographical Society (1896, pp. 234–250) reports a surprising and important discovery made by M. Bonin while travelling between the Upper Yangtse-Kiang and its tributary, the Yalung-Kiang. The Kinsha River is represented on the maps as the Yangtse itself, the Upper Yangtse being shown in South-East Tibet as the Di-chu and in West China as the Kinsha. But M. Bonin, the first European to visit the town of Li-Kiang-fu, discovered that a little below the sharp angle made by the Kinsha near that town it makes a wide sweep to the north and joins the Yalung in about 28° N. lat., some 85 geographical miles north of the point of junction indicated on the map. The Kinsha, instead of being the Yangtse, therefore, appears to be a tributary of the Yalung affluent of the great river, and the Yangtse, properly so called, begins in Western China, while receiving through the Yalung tributary waters from Tibet. Mr. Hosie crossed the Kinsha, which he supposed to be the Yangtse, in 1883. All these river courses in China derive their present delineation from D'Anville's map, whose author was compelled to rely, for this region, chiefly upon vague report. M. Bonin does not appear to have followed the Kinsha continuously in its northern sweep, and *The Geographical Journal* (Nov., 1896, p. 515) raises the query whether a bifurcation (a channel joining two rivers) may not here unite the Kinsha and the Yalung, such as was hinted at in a neighboring region by Garnier.

VARIATIONS IN THE LAKE DISTRICT OF LOB-NOR.—The studies of Dr. Sven Hedin in the region of Lob-nor, in central Asia, seem to clear up the mystery attached to it and will put an end to further controversy. Hedin has visited both the region where the Chinese geographers placed Lob-nor, and also the district a little further

south, where Prjevalsky placed the lake in the position it occupies on our maps. He contributes to *Petermanns Mitteilungen* (No. 9, 1896) a series of nine maps to illustrate the changes that have taken place, or, in some cases, have probably taken place, in the position of the reservoirs that have received the waters of the Tarim, the Konche-daria and the Cherchen-daria. He says the basin of the Tarim is like a spoon, the deeper end towards the east, surrounded on all sides except the east by mountain ranges, from which flow rivers, most of which disappear in the sands before they reach the main river. Dust and sand are driven west by the prevailing east winds, and are spread over the surface in this lake region. The Tarim and the other rivers also bring down considerable matter in suspension, and the mud is deposited in the reservoir district. The result is that this region where the waters accumulate is now practically on a dead level, and it requires only the formation of sand dunes or mud-flats a little above the general level to change the position of the main water receptacle, which seems to oscillate to the north and then back to the south. The two large lakes which formed the Lob-nor of Prjevalsky (1876-1885) were represented at the time of Dr. Hedin's visit in April, 1896, by narrow basins, in which the water was eight inches deep, with a considerable extent of marsh, while the main body of water was further north. The marshes are very salt, and the lakes at low water are a little brackish, but, considering the fact that they are constantly changing their position, it is not surprising that at flood time, when the lakes are comparatively large, the water in them is quite fresh.

THE POLAR REGIONS.

MR. JACKSON'S WORK IN FRANZ JOSEF LAND.—The progress of the Jackson-Harmsworth Polar expedition in the season of 1895-96 is described by Mr. Arthur M. Brice in a valuable paper printed in *The Geographical Journal* for December. On July 11, 1895, Mr. Jackson started along the south-west side of Franz Josef Land to survey the coast line and discover, if possible, any new land to the westward. He travelled in a whale boat with five comrades and a month's provisions. He reached Cape Neale on the 22d and from its summit Jackson distinguished high land bearing west of the farthest point previously seen. On the 28th he sailed across Cambridge Bay to the south-west coast of this land which he named Alexandra Land. He has a theory that it is the southern part of the long-sought Gilies Land. He skirted this coast for about 30 miles to a very imposing cape. At the base of this headland was a

vertical face of ice 30 feet high; then steep ice-covered talus arose to the rocks 700 feet above on which rested the ice-cap, rising to an elevation of 2,000 feet. Jackson named this promontory Cape Mary Harmsworth. A terrible gale blew the boat fifty miles off the land towards the south-east and it was impossible to renew work in that direction. He regained his camp at Elmwood on Aug. 12, having advanced Franz Josef Land a considerable distance westward of the previously known limit and being the first to reach and ascend parts of the coast which Mr. Leigh Smith, in 1880 and 1881, saw from his steamer *Eira*, at a distance.

On March 18, 1896, Jackson, Armitage and the sailor Blomqvist started on a journey north with seven sledges drawn by a pony and sixteen dogs. They were able to march rapidly and in seven days were near the 81st parallel. They camped on March 26 near a cape 700 feet high to which Jackson gave the name of Richthofen and, next day, from the top of the cape, they saw a large open sea stretching before them, almost wholly free from ice. The explorer named it Queen Victoria Sea. Islands were seen to the north-east and north-west and, far away to the north, was an island which Jackson thought might prove to be the King Oscar Land of Payer. In the previous year Jackson had visited the same place, but thick fog and snow had obscured the sea and he saw only a long stretch of bay ice. This discovery confirmed Jackson's belief, the result of his work in 1894-95, that the Franz Josef Land archipelago does not extend far northward. We now know that the *Fram*'s drift past these islands on the north without seeing land establishes this fact.

For two years Jackson has found the ice packed against the land in August and September, while in June and July there is an open sea and he believes the latter months are best for navigating in these waters. Mr. Jackson has seen very few glaciers of large extent or of the common type. An ice-cap crowns nearly all the islands, but seldom descends to the sea, and Jackson records only one instance of a glacier projecting well out into the sea. This glacier, on the south-east coast of Hooker Island launches flat-topped bergs. All the bergs are low, the highest not exceeding 75 feet. The ice-cap and inland glaciers show little sign of movement, though the angle of slope is often 15°. Their surface is smooth and crevasses are few. The remarkable glacier faces which Peary found in north-west Greenland, showing many minute layers exhibiting stratification with some folding and false bedding, have also been discovered in Franz Josef Land. The ice-cap varies from a few to a thousand feet in thickness. Bruce Island, for instance, is capped with ice.

Its rocks only appear at intervals at the level of the shore-line and its coast is nothing else than the face of the ice-cap; but some islands are found quite free from ice. Mr. Brice's paper is supplemented by a valuable report on the flora of the archipelago by Mr. Fisher, the botanist of the expedition.

LIEUT. PAYER'S MAP OF FRANZ JOSEF LAND.—Dr. Nansen reported, on his return, that he had failed to identify, while in Franz Josef Land, a single geographical feature discovered by the Austrian explorer Payer, and that Payer's map of the northern part of Austria Sound was certainly all wrong. In August, last year, between the day when he first reached the coast of Franz Josef Land and the time when he attained the place of his winter camp, he crossed, according to his determination, Payer's sledge tracks without finding any agreement with his map. Mr. Jackson, further west, also reports his inability to reconcile his discoveries with the long existing map of Franz Josef Land. It will be impossible to judge accurately of the alleged imperfections of Payer's map until all the data collected by Nansen and Jackson are made public. Prof. Cope-land says (*Nature*, Nov. 12) that there is no doubt of the accuracy of the southern part of Payer's map, the latitudes and longitudes of the Austrian exploring steamer *Tegetthoff* in the land ice and of certain points on the neighboring coast having all the precision that could be obtained from a long series of meridian altitudes, and no less than 218 lunar distances, combined with systematic triangulation, which were connected with all the neighboring islands within 30 or 40 miles. The satisfactory character of this part of the map was proved by Mr. Leigh Smith. The survey naturally grew less accurate as it was extended up Austria Sound. The latitudes, however, must have been near the truth, as they were based on numerous meridian altitudes of the sun, and fortunately an observation was secured in $81^{\circ} 57'$ N. lat., within a few miles of the most northern point Payer reached. His longitudes, however, for his sledge journey, seem to be considerably out of the way. He depended solely on compass azimuths or bearings taken with a theodolite, often under unfavorable conditions. Exaggerated inferences seem also to have been drawn from the coast lines he saw as to the extent of the country behind them. Lieut. Payer has deposited with the Royal Geographical Society all the materials he used in constructing his map.

THE CORNELL PARTY AT MELVILLE BAY.—Mr. R. S. Tarr has contributed to *Science* a report of the work of his party from Cornell

University which was landed at Nugsuak Peninsula, near the south terminus of the Melville Bay coast, by R. E. Peary, C. E., U. S. N., on Aug. 7 last. The party remained there till Sept. 7. A large glacier at the south-east base of the peninsula, which was named Cornell glacier, is now in rapid retreat, and this is regarded by Mr. Tarr as a part of a general withdrawal of a vast ice-sheet which formerly extended out beyond the Duck islands, 32 miles from the front of the Cornell glacier. Mr. Tarr thinks that the present glaciation in this part of Greenland is a shrunken remnant of a former greater sheet of unknown extension to the west.

MR. ANDRÉE'S BALLOON EXPEDITION.—*The Geographical Journal*, summarizing Mr. S. A. Andrée's report on his balloon expedition to Spitzbergen (*Ymer*, 1896, Häft 3), says that the *Virgo* sailed with his party from Tromsö on June 14, 1896. The steamer called at Isfjord and Norway islands, and on June 23 found a suitable place for erecting the balloon house on Dane's Island. To build the house and land the balloon took nearly a month. The house was ready on July 20; filling the balloon began on July 23, and it was ready for sailing on July 27. But the essential winds from a southerly quarter did not come and, as it was necessary for the ship to go back, the balloon was packed up and started on its return journey on Aug. 20, reaching Göteborg nine days later. There was a feeble southern wind for a few hours only on July 29 and 30 and next on August 2 and 3, which, however, changed in the afternoons to a wind from the north or north-east. As the balloon is now in working order, the cost of a new expedition will not exceed 53,000 kroner, provided next year's party is taken to Spitzbergen on a ship of the Swedish Navy. Mr. Andrée believes the balloon expedition is practicable if everything is ready for the ascent earlier in the summer. There was no lack of favorable winds in the earlier part of the stay at Dane's Island last summer. The expedition at least demonstrated that a balloon may be filled in Spitzbergen.

PROPOSED BELGIAN ANTARCTIC RESEARCH.—Lieut. de Gerlache, of the Belgian Navy, who is organizing and will lead the projected Belgian expedition to the South Polar regions, has informed Reuter's Agency that the expedition will start from Antwerp about the middle of July next. The steamer *Belgica*, which has been engaged, will be specially strengthened for ice navigations and arranged for the convenience of scientific workers. A laboratory will be built on the deck, and she will be provisioned for three years. The ex-

pedition will be particularly devoted to geological and zoölogical research, and the staff will include M. Archowsky, Geological Chemist, Lieut. Danco, who will conduct the magnetic and the meteorological work, M. Racovitz, who will have charge of the dredging, and M. Taguin, physician and scientific assistant.

DISTRIBUTION OF ICEBERGS IN ANTARCTICA.—The November Pilot Chart of the North Pacific (U. S. Hydrographic Office) has an account of the chronological and geographical distribution of icebergs in the Southern and Antarctic oceans. The bergs are apparently formed at various points of the Antarctic Continent, and a great many of them drift north and east, and are grouped principally in the vicinity of Cape Horn, the Falkland Islands and an area south of Africa. The Antarctic icebergs are much larger and more compact than those of Arctic origin, and therefore endure longer and drift to lower latitudes, the northern limit of the South Polar bergs differing with the seasons. Two charts are given, one showing the seasonal iceberg limits, and the other, the icebergs reported at different seasons from 1891 to 1895.

OCEANOGRAPHY.

PLANKTON AND HYDROGRAPHY.—It has long been known that the sea abounds in microscopic organisms, both animal and vegetable. Prof. Hensen proposed the name of plankton for these pelagic forms and it has been universally accepted. Prof. P. T. Cleve says (*Nature*, Nov. 26, 1896) that he examined, several years ago, specimens of vegetable plankton collected by Swedish Arctic expeditions as well as samples from various regions in tropical seas, and became convinced that certain parts of the oceans are characterized by different species. On the west coast of Sweden, in 1893, he examined plankton obtained at various depths in water strata of differing temperatures and salinity, and found further that the various strata were characterized by different amounts of plankton and by different species. He has, later, examined a large number of specimens of vegetable plankton, chiefly from the Skager Rak and Kattegat, and, according to the prevailing species, has distinguished four types. (1) The *Tripos*-plankton prevails in the summer, and in all cases the water containing it seems to be derived both from the North Sea and the Baltic. (2) The *Didymus*-plankton was predominant in the Skager Rak and Kattegat in November, 1893, filling the fiords from the bottom to the surface, and, with the water containing it, the herring arrived on the shores

of Scandinavia. This water apparently drove away the whole of the summer water from bottom to surface, and seems, without doubt, to have come from the southern North Sea, along the west coast of Denmark. (3) The Tricho plankton, a North Atlantic type, found almost pure south of Ireland, but rarely in a pure state on the Scandinavian coast. (4) The Sira-plankton, of Arctic origin, occurring on the Scandinavian coast in February and March. During the last days of June, 1893, the plankton changed in Gullmarsfjord, and with the advent of Entomostraca (animal plankton), mackerel appeared. Prof. Cleve urges that the study of plankton is thus seen to be of great interest both in relation to hydrography and also to meteorology and fishery questions. The close connection between the state of the sea and the movements of the air, and the causes of the migration of fish, may be found to be intimately connected with the change of water containing different kinds of plankton. He emphasizes the importance of a thorough and systematic study of the plankton of the North Sea.

AUSTRALASIA.

A PASS OVER THE NEW ZEALAND ALPS.—Mr. E. A. FitzGerald, who has made the first ascent of four peaks in the New Zealand Alps, Mount Tasman (11,475 feet), Mount Sefton (10,350 feet), Mount Haidinger (10,054 feet) and Mount Sealy (8,631 feet), also claims to have discovered a pass of importance to the colony. This great mountain wall has prevented communication between the east and west coasts except by sea and a direct route across the barrier anywhere near the middle of the island was much to be desired. The pass, which now bears Mr. FitzGerald's name, leads directly from one of the branches of the Tasman valley to the west coast. Its discoverer says that with some expenditure in making a track, the pass may be easily crossed by pack-horses and cattle during the summer season. On the other hand, the Report of the Department of Lands and Surveys of New Zealand (1895-96), throws doubt on the availability of this pass. It is 7,180 feet high and the route crosses a snow-field. Mr. Brodrick says that the pass discovered by him in 1890, which is 18 miles from Lake Ohau, is only 5,300 feet high and has been crossed by Mr. D. Matheson with pack-horses.

EDUCATIONAL.

ILLUSTRATING MAP PROJECTIONS.—Mr. Andrew J. Herbertson, lecturer on Geography in Owen College, Manchester, says in one of

his papers on "Geographical Education" (*Scot. Geog. Mag.*, Nov., 1896): "There is real difficulty for most people, passing from the globe to the map, in understanding how the curved surface is expressed on the flat. After trying many methods, I have devised an apparatus for illustrating projections graphically by throwing the shadow of a skeleton hemisphere on a screen. By modifying the positions of the light and the hemisphere, and by bending the screen into a half cylindrical or conical shape, and then unbending again, after tracing the shadows, various projections can be shown. The making of the net-work of a map on the flat surface in this way is very effective, and also gives an idea of the different distortions made in the earth's surface by various projections."

Like all the best teachers to-day, Mr. Herbertson believes that for map-drawing in schools, mechanical copying is almost wholly waste labor. It is absurd, he says, to expect children to know the exact shape of every country, because the shapes differ according to the map projection used. The maps they draw should be simplified and without political boundaries until the children are in an advanced stage of the study. "Climate and distribution maps of vegetation, animals, man, occupations, etc., should be drawn. A boy who can sketch from memory, in rough outline, a dozen maps showing physical features, the rainy and dry regions, the hot and cold regions, the desert, pasture and forest lands, the sparsely and densely peopled regions, etc., knows far more about geography than the boy who can reproduce the sinuosities of coast and river, and the intricate zigzags of political boundaries."

GEOGRAPHICAL LECTURES.—Columbia University is giving this winter a series of geographical lectures, in co-operation with the American Museum of Natural History. At the first lecture on Dec. 5, Prof. James F. Kemp of Columbia spoke of the Rocky Mountains. He limited the term Rocky Mountains to the eastern ranges of the North American Cordilleras, in accordance with the best usage. Beginning at the south in New Mexico, he considered the mountains in the different States, bringing out the topographic features of peaks and parks and showing the relation of the mountains to man in the way of forests, mining, etc. In every case it was shown that the higher peaks are closely confined to the areas of granitic rocks. In New Mexico few peaks rise above 10,000 feet, but in Colorado many peaks rise to 18,000 feet, and their closely accordant summits present one of the great problems for the modern geographer who would interpret the features of the West. Following

north through Montana and Wyoming, the Rocky Mountains may be traced beyond the national boundary, where they become merged with the Cascade and Coast Ranges, so that they are not distinctly separable unless studied closely from a physiographic standpoint.

The second lecture on December 12, by Dr. C. Willard Hayes, of the United States Geological Survey, was on the Mountains of Alaska. He divided the territory into its various physiographic divisions and considered the topography and character of each with some detail. The great interior is known as the Yukon Plateau. It is a much dissected peneplain, four-fifths of which are less than 5,000 feet in altitude. In the south-east are the Rocky Mountains 7,000 to 9,000 feet in altitude, and extending an unknown distance into the territory. West of the Rockies is a small region known as the Cassiar Range, in many ways like the Rockies, but of volcanic origin. Still further east is the Coast Plateau, bordering the coast north to the St. Elias region. It is about eighty miles wide and much dissected by fiords. The precipitation here is excessive and glaciers are numerous. North and west of the St. Elias region is the Chigmit Range, more than 240 miles long and occupying the peninsula of Alaska. The rocks here are mostly volcanic and there are at least ten active volcanoes. The region of the greatest interest is the St. Elias, which is concentric in outline and includes the Alexander and St. Elias Alps and the Wrangell group. The southwestern horn of the crescent is the Kenai peninsula. Of the great mountains Mt. Logan is the highest, 19,539 feet in altitude, thus overtopping St. Elias (18,010) by over 1,500 feet. The topography in the St. Elias region is very youthful and the mountains are, therefore, very angular. The snow line is at a very low altitude, and hence the difficulty of ascending the greater peaks for accurate geographical work.

The third lecture was by Mr. Bailey Willis, of the United States Geological Survey, on the Cascade Mountains of the Pacific Coast. Mr. Willis defined the limits of the Cascade as Lassen Peak on the south, and probably Alaska on the north, the mountains extending through Oregon, Washington and British Columbia. The range runs about 100 miles from the coast and parallel to it, and is from 50 to 100 miles broad. The general elevation is 7,000 feet, and many peaks reach 10,000, the highest 14,500 feet. The southern part, extending into southern Washington, is volcanic in origin and of recent date. The northern part is of true mountain character, and contains few rocks of volcanic origin. Three types of topography of volcanic origin are to be seen in the southern portion: (1) The

great lava plains of Idaho, eastern Washington and Utah, where lava emerged in a very liquid manner; (2) the great plateau from northern California to southern Washington, 6,000 to 7,000 feet in altitude, where the lava was more viscous; and (3), the more than a score of large volcanic cones, rising in altitude from 9,000 to 14,500 feet. In the northern Cascades the mountains represent the remnants of a peneplain uplifted to 7,000 feet, with many wind gaps cut 3,000 feet into the mass by the long, persistent antecedent rivers. The mountains are now much worn by ice and water, and in their aiguille peaks are a witness of the work of ice to which they have been subjected. Among special features of interest in the Cascades are the volcanic peaks of Rainier (Tacoma), of Shasta and Crater Lake. Crater Lake is the site of a once high volcanic peak termed Mt. Mazama, that has probably sunk into the throat beneath. The lake in this old volcanic crater has nearly vertical walls 2,000 feet high and has a depth of 2,000 feet. In the lake is a small crater of more recent date, known as Wizard Isle. This, too, is an extinct volcanic cone and its crater is occupied by a small lake.

The fourth lecture was given on December 26 by Mr. H. M. Wilson, of the United States Geological Survey. Subject: The Sierra Madre of Mexico.

GEOGRAPHIC AIDS.—Mr. R. E. Dodge, of the Teachers College, New York City, supplies this list of Aids in the Study of Geography, published in this country. He has included some text books which give much attention to physiography:

BOOKS.

Tarr's Elementary Physical Geography. Macmillan. \$1.25.

Use of Governmental Maps in Schools. Henry Holt. 30c.

Frye's Primary and Complete Geographies. Ginn & Co.

Frye's Brooks and Brook Basins. Ginn & Co.

National Geographic Monographs. Set \$1.50. 20c. each. (1) Physiographic Processes; Powell. (2) Physiographic Features; Powell. (3) Physiographic Regions of the United States; Powell. (4) Present and Extinct Lakes of Nevada; Russell. (5) Beaches and Tidal Marshes of the Atlantic Coast; Shaler. (6) The Northern Appalachians; Willis. (7) Niagara Falls and their History; Gilbert. (8) Mount Shasta, a Typical Volcano; Diller. (9) The Physical Geography of Southern New England; Davis. (10) The Southern Appalachians; Hayes. Nos. 1, 2, 3 and 9 are especially valuable.

Russell. Lakes of North America. Ginn & Co.

Russell. Glaciers of North America. Ginn & Co. (In press.)

Roosevelt. The Winning of the West. 4 vols.

Shaler. Nature and Man in North America. Scribners.

Shaler. Story of our Continent. Ginn & Co.

Whitney. The United States. Little, Brown & Co.

Tarr. The Teacher's Outfit in Physical Geography. (School Review. March and April, 1896.)

Annual Reports of the United States Geological Survey. 12th contains Origin and Nature of Soils, by Shaler; 13th contains Geological History of Harbors, by Shaler; 15th contains Geology of the Common Roads, by Shaler.

History of Individual States in American Commonwealth Series.

MAPS.

See descriptive list in "Use of Governmental Maps in Schools."

Relief Map of United States in Thirteenth Annual Report of the United States Geological Survey.

Geological Map of United States in the Fourteenth Annual Report.

Folios of the United States Geological Survey. 25c. each. Order by Number.

LANTERN SLIDES.

See list to be obtained from E. E. Howell, 612 Seventeenth Street, N. W., Washington, D. C.

MODELS.

Chattanooga District. Published by E. E. Howell. \$60.

Vicinity of New York. (Slated.) Ready soon.

This list might be extended to advantage, particularly by the inclusion of some foreign works. We add to it the paper on "Geography from Nature" (BULLETIN AMER. GEOG. SOC., 1896, pp. 146-156), by Mr. Dodge, describing how geographical excursions may be made profitable in the neighborhood of New York City. Mr. Herbertson includes it in his bibliography in the *Scottish Geographical Magazine*, and says: "Teachers may derive many useful hints from this article."

GENERAL.

The Royal Society, of Great Britain, has conferred one of its medals on Sir Archibald Geikie, on the ground that of all British geologists he is the most distinguished, not only as regards the number and importance of the geological papers which he has published as an original investigator, but as one whose educational works on geology have had a most material influence upon the advancement of scientific knowledge.

The expedition sent by the Royal Society to the Ellice Islands to bore through the coral (BULLETIN, No. 3, 1896), for the purpose of learning the nature of the foundation upon which it rests, did not succeed in its mission, the boring apparatus being choked by quicksand.

The Icelandic Earthquake of Aug. 26 last seems to have been clearly indicated in Paris by the magnetograph in the Observatoire du Parc Saint-Maur.

The daily newspapers have printed accounts of the murder of the Austrian geologist Baron von Foullon-Norbeck by the natives of Guadalcanar in the Solomon group, after he had reached Lion Head, a mountain in the interior of the island. He was attached to the staff of the gunboat *Albatross*, which was on a scientific voyage around the world.